

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Carrier Current Systems,)	ET Docket No. 03-104
Including Broadband)	
over Power Line Systems)	
)	
Amendment of Part 15 regarding))	
new requirements and)	
measurement guidelines for)	
Access Broadband over Power)	
Line Systems)	ET Docket No. 04-37

REPLY COMMENTS OF PPL TELCOM, LLC

Table of Contents

- I. Introduction and Background.**
 - A. Summary of PPL Telcom's Reply Comments.**
 - B. PPL Telcom's Deployment of BPL.**
- II. Benefits of BPL.**
 - A. Utility Applications**
 - B. Commercial Applications**
 - C. The Commission Should Encourage BPL Deployments
and Should Limit Unnecessary Burdens On BPL
System Operators**

III. BPL Interference Potential Is Limited And Can Be Mitigated.

A. Shifting The Burden Of Part 15 Certification To The BPL Operators Will Adversely Impact Future Deployments.

B. Interference Mitigation Techniques Proposed By The Commission Can Work.

- 1. PPL Telcom Supports A Post Installation Data Base Operated By UPLC.**
- 2. PPL Telcom Opposes Advance Notification/Coordination Of BPL Deployments.**
- 3. PPL Telcom Strongly Opposes Mandatory Power Control.**
- 4. PPL Telcom Supports Progress Energy's Recommendation To Reduce Frivolous Complaints.**
- 5. PPL Telcom Opposes Creating BPL's Own Rule Part Or Sub-Part of Part 15.**

C. BPL Measurement Guidelines Should Not Incorporate The Adjustment Factor Proposed By The NTIA.

IV. Conclusion.

I. Introduction and Background.

PPL Telcom, LLC ("PPL Telcom") pursuant to the rules and regulations of the Federal Communications Commission (the "FCC" or the "Commission"), 47 C.F.R. §§ 1.415 and 1.419, submits these reply comments in response to the Commission's Notice of Proposed Rule Making adopted on February 12, 2004 and released on February 23, 2004.

A. Summary of PPL Telcom's Reply Comments.

PPL Telcom opposes many of the recent proposals of the National Telecommunications and Information Administration (NTIA) as unreasonably burdensome, unnecessary and inconsistent with PPL Telcom's operating experience with BPL. Specifically, the interference potential of BPL is limited and can be effectively mitigated under the Commission's proposals. BPL does not warrant its own rule part or sub-part of Part 15 and the BPL Measurement Guidelines should not incorporate the adjustment factor proposed by the NTIA. Shifting the burden of Part 15 certification to the BPL operators will adversely impact future deployments. PPL Telcom supports a post installation database operated by the United Power Line

Council, but it opposes any form of advance notification as anti-competitive.

B. PPL Telcom's Deployment of BPL.

PPL Telcom, a subsidiary of PPL Corporation located in Allentown, Pennsylvania, has been actively engaged in evaluating BPL technology and services since late 1999. In late 2001, PPL Telcom and its affiliates began construction and testing for a technical trial of BPL in Emmaus, Pennsylvania. During 2002, BPL technical trials were expanded to include multiple technologies and additional service area. Results of these technical trials indicated that BPL was viable for both access and in-home high-speed data communications.

During 2003, PPL Telcom's technical trials were transitioned to market trials. By the end of June, 2004, PPL Telcom's BPL service will be available to more than 10,000 homes and businesses in the Lehigh Valley area of Pennsylvania. PPL Telcom presently has several hundred BPL broadband service subscribers with several hundred additional subscribers presently being scheduled for BPL service installation.

II. Benefits of BPL.

A. Commercial Applications.

PPL Telcom has seen first hand that BPL both promotes broadband competition and offers access to broadband where no alternative service is available. PPL Telcom is presently providing broadband service to communities in the Lehigh Valley that were either not served at all by other broadband providers or were provided with limited, one-way broadband service from cable service providers.

Indeed, PPL Telcom's experience has clearly shown that communities with little or no broadband access need not be isolated to rural America. Allentown, Pennsylvania's third largest city and the major city in the Lehigh Valley area, has many areas both within its city boundaries and located within less than 10 miles from the city center that have either no broadband service or only one-way cable broadband service available to residents.

PPL Telcom has further found that broadband service is not being rapidly or ubiquitously deployed by traditional service suppliers. Cable providers who are financially unable or commercially unwilling to provide broadband service may serve certain areas, and DSL service remains

confined to a limited geographic area surrounding telephone company central offices.

PPL Telcom's BPL service offers not only an alternative means of providing broadband to these unserved and underserved areas, but also provides subscribers sought-after features such as ease of home networking, simple access, wireless (WiFi) capability (depending on BPL technology used) and high-speed bi-directional capability. This service is being provided at a subscriber cost that is competitive with or lower than comparable broadband services, where they are available.

PPL Telcom is beginning development of new BPL services such as VoIP and will be conducting a trial of this service. Also, a variety of additional BPL services are now being investigated and will be considered for future commercial implementation.

PPL Telcom's BPL deployment experience has shown that this technology not only makes efficient use of present infrastructure but also can be deployed in new areas in a matter of weeks. This rapid, "smart build" feature of BPL technology is a major advantage in scaling from market trials to full commercial deployment.

B Utility Applications.

BPL can also provide a communication system that could be utilized by electric utilities to provide enhanced energy services and increased reliability to electric customers.

PPL Electric Utilities already uses a narrow band power line communication technology for automated meter reading. When BPL is deployed on a sufficient portion of an electric utility's network, this technology can be used to provide control and monitoring to distribution equipment, which may be beyond the communication reach of other technologies such as SCADA that are typically confined to substations. More efficient control of these devices could, in turn, provide for enhanced power quality service, remote power system service restoration and improved equipment maintenance capability.

C. The Commission Should Encourage BPL Deployments and Should Limit Unnecessary Burdens On BPL System Operators.

In order to encourage deployment of BPL systems, the Commission should adopt rules that create only reasonable, appropriate and identifiable obligations on BPL system operators. Many of the NTIA's measurement, certification

and mitigation proposals could create obstacles to the further deployment of BPL systems due to the added cost of such burdens. Such costs should be weighed by the Commission against limited potential risk of interference posed by BPL systems.

III. BPL Interference Potential Is Limited And Can Be Mitigated.

PPL Telcom has closely followed the comments from the NTIA and others in this proceeding that contend that BPL presents a significant potential risk of interference to licensed spectrum users. However, PPL Telcom's direct experience with actual BPL deployments since early 2002 strongly indicates otherwise.

In nearly 30 months of BPL operational experience, PPL Telcom has received only four complaints of interference. These four complaints were from amateur radio operators residing in close proximity (a few hundred feet or less) to BPL devices operating at the interfering frequency. In all cases, PPL Telcom was able to mitigate the interference remotely. No complaints have been received from amateur radio operators and other licensed services located at greater distances from BPL equipment. Therefore, PPL

Telcom's BPL deployment experience, which includes operation of several hundred BPL devices from two technology providers, continues to indicate that BPL is not a significant source of RF interference.

Contrary to the NTIA's reply comments, PPL's experience with BPL strongly suggests that power lines are not efficient radiators of BPL signals and that emissions are greatest near the device itself. If power lines radiated efficiently, as the NTIA suggests, then it would be probable that PPL Telcom's BPL deployments, comprising an aggregate of more than 250,000 feet of primary power lines, would have precipitated more than four interference complaints. Similarly, if, as the NTIA asserts, discontinuities located at some distance from the BPL device radiated at levels greater than the BPL devices themselves, interference complaints would be originating from individuals located near discontinuities and not just the BPL devices. However, as mentioned previously, all four complainants were located in close to BPL devices.

**A. Shifting The Burden Of Part 15 Certification To The
BPL Operators Will Adversely Impact Future
Deployments.**

NTIA has recommended that BPL equipment operators, such as PPL Telcom, obtain certification for deployed BPL equipment before that equipment can be operated. However, the FCC's Part 15 Rules generally require that manufacturers of unintentional radiators, such as BPL equipment, comply with a verification process for equipment authorization.

Requiring equipment operators to obtain certification would impose significant cost and liability burdens on companies considering deploying and operating BPL equipment. Therefore, this requirement could have a significant detrimental impact on potential BPL operators' decisions to deploy this technology. And, since the FCC Part 15 rules already require BPL operators to avoid causing interference and mitigate interference if it occurs, no additional protection from interference would likely be derived from this recommendation.

B. Interference Mitigation Techniques Proposed By The Commission Can Work.

PPL Telcom's experience with BPL interference mitigation indicates that the various techniques suggested by the Commission, including frequency shifting and notching, are effective.

1. PPL Telcom Supports A Post Installation Database Operated By UPLC.

A limited, post-installation BPL database operated by the United Power Line Council (UPLC), is considered a reasonable means to assure that licensed spectrum users are able to contact the proper BPL equipment operator in a timely manner. Industry operation of this database will discourage use of the information contained for competitive or malicious purposes.

2. PPL Telcom Opposes Advance Notification/Coordination Of BPL Deployments.

NTIA recommends BPL operators coordinate frequencies used prior to deploying in a "coordination area" or notify spectrum licensees at least thirty days in advance of deployment. Given that such "coordination areas" may apply to mobile receivers that may be anywhere and that the information to be provided is recommended to include the

maximum number of BPL devices, the recommendation is fundamentally flawed and is anti-competitive.

3. PPL Telcom Strongly Opposes Mandatory Power Control.

NTIA also recommends mandatory power control from BPL equipment, excluded frequency bands and exclusion zones. NTIA has implied that reduction in power levels by as much as 20 dB may be necessary, in some cases, to protect federal government installations. In imposing exclusion zones and excluded frequencies, NTIA would place a burden on BPL service providers that it does not impose on other unintentional or intentional radiators and restricted bands of operation only apply to *intentional* radiators.

NTIA furthermore recommends that BPL operators, such as PPL Telcom, shut down operations to test for interference at the time a complaint is received or shortly thereafter at a mutually agreed schedule. Such a shutdown would interrupt service to dozens, or potentially hundreds, of BPL subscribers with no verification that BPL was even potentially the source of interference. For example, PPL Telcom received a complaint of interference from an amateur radio operator that, upon investigation by PPL Telcom, was determined to have originated from an electronic air cleaner located in the home of the complainant. PPL

Telcom's experience in investigating interference complaints clearly shows that shutdowns of BPL service are both unwarranted and unnecessary. The characteristic signatures of OFDM or DSSS modulation techniques used by BPL are clearly discernable. A shutdown of service to verify whether BPL is the source of interference is not warranted.

4. PPL Telcom Supports Progress Energy's

Recommendation To Reduce Frivolous Complaints.

Defining harmful interference may be necessary in order to reduce frivolous complaints. Section 15.3(m) defines "harmful interference" as:

any emission, radiation, or induction that endangers the functioning of a radio navigation service or of other safety service or seriously degrades, obstructs, or repeatedly interrupts a radio communications service operating in accordance with this chapter.

For instance, one of the four interference complaints PPL Telcom received was from an amateur radio operator that reported he could simply "detect" the unwanted BPL signal and, therefore, considered it harmful. Progress Energy has asked the FCC to adopt a four-part test for harmful interference designed to discourage frivolous complaints.¹ PPL Telcom supports this type of test as both reasonable

¹ The four part test requires the interference to occur during the normal course of the complainant's operations, should be more than momentary, should be of such a magnitude that communications are practically unintelligible and the receiver should meet certain standards for sensitivity.

and necessary to separate legitimate interference complaints from those that do not merit further investigation.

**5. PPL Telcom Opposes Creating BPL's Own Rule Part
Or Sub-Part of Part 15.**

PPL Telcom supports the Commission's approach with respect to incorporation of BPL rules under Part 15, and believes BPL rules do not warrant their own part or sub-part of Part 15. PPL Telcom finds the Commission's approach sufficiently clear, and rejects the NTIA's analogy to cable television systems. Such an analogy is misleading in that cable television systems pose inherently greater potential for interference by operating at higher power levels than BPL systems, and rely on coaxial, shielded transmission lines to prevent interference. As confirmed by PPL Telcom's experience, BPL systems pose limited inherent potential for interference. Additionally, the Commission's approach allows for refinements to testing and measurement guidelines as they are developed through experience and the NTIA's continued study and analysis.

C. BPL Measurement Guidelines Should Not Incorporate The Adjustment Factor Proposed By The NTIA.

PPL Telcom supports the measurement of radiated emissions from BPL devices in accordance with Part 15 rules at 1-4 meters above the ground and at a distance of 30 and 10 meters from the device. PPL Telcom opposes the use of an "adjustment factor," as proposed by NTIA, in an attempt to predict how measurements may increase with increasing height. PPL Telcom has found little, and not consistent, increase in emission with increasing height. Other factors in distribution power line construction such as the type of construction, phase spacing, grounding configuration, age of equipment and type and number of electrical devices connected to the line appear to have as much, or more, influence on radiated emissions as measurement height.

NTIA also recommends measurements along distribution power lines that are at least 600 meters in length and are devoid of impedance discontinuities. In the experience of PPL Telcom, such lines on the PPL Electric Utilities' distribution system are extremely rare. Distribution lines encountered by PPL Telcom invariably have had transformers (about every 3-4 spans), taps, capacitor banks, switches, reclosers, and other devices spaced at intervals that would make such a requirement virtually impossible to fulfill.

IV. Conclusion.

PPL Telcom presently operates one of the largest BPL deployments in the United States. PPL Telcom has demonstrated its determination to overcome technical hurdles encountered in deployment of BPL and its ability to resolve interference complaints from those who may be affected by nearby BPL equipment.

PPL Telcom appreciates the work of the NTIA and others that are serious about investigating this emerging technology. However, PPL Telcom's field experience, gathered though nearly 30 months of actual BPL system operation does not support the NTIA's recommendations that appear to be based on a "worst case" interpretation and extrapolation of limited test data. The adoption of these recommendations would be chilling to the emerging BPL industry.

PPL Telcom will continue to actively participate in the UPLC's efforts to work with the NTIA and appreciates the Commission's encouragement of BPL technology through this proceeding. PPL Telcom looks forward to working with the Commission and other interested stakeholders in the development and deployment of this new technology.

Respectfully submitted,

PPL Telcom, LLC

By: _____

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